

$$\Delta + \sum V(k_1 - k_1') \frac{\Delta}{\sqrt{e^2 + |\Delta|^2}} th \frac{\sqrt{e^2 + |\Delta|^2}}{2T} = 0.$$

Δ имеет смысл энергетической щели в спектре возбуждений монослоя кристаллического конденсата на подложке. Появление $\Delta \neq 0$ является критерием начала конденсации несоизмерной фазы на кристаллической подложке.

Численное решение уравнения для энергетической щели Δ было проведено с помощью пакета MathCAD.

Экспериментальное подтверждение полученных результатов затруднено из-за сложности определения критических параметров в момент появления зародышей новой фазы. Но если отождествить ширину щели Δ с величиной активационного барьера адсорбционно-десорбционных процессов, то с помощью уравнения для энергетической щели Δ можно проследить зависимость энергии активации от степени по-

крытия.

Следует отметить, что формирование субмонослойных плёнок носит доменный характер, структура доменов зависит от величины покрытия, и эта зависимость носит пороговый характер.

Такой вывод позволяет предположить, что во всём интервале Δx_i , в пределах которого энергия активации меняется монотонно, латеральное взаимодействие между частицами плёнки оказывается неизменным, а некоторое изменение энергии активации в пределах интервала Δx_i связано с влиянием поля подложки. Скачкообразное же изменение энергии активации, свидетельствующее о структурных изменениях в плёнке, связано со скачкообразным изменением энергии двухчастичного взаимодействия. С учётом этого факта можно построить зависимость энергии активации от параметров двухчастичного взаимодействия и поля подложки (см. рис. 1).

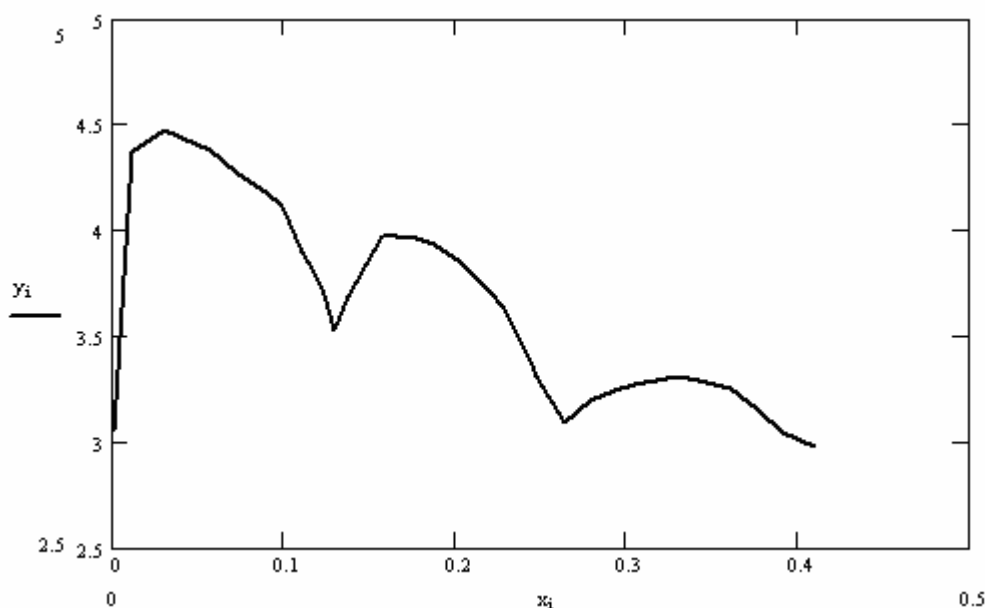


Рисунок 1. Зависимость энергии активации десорбции от степени покрытия

Сравнение полученного результата с экспериментальным [4] показывает, что для расчетной кривой в пределах одного монотонного участка изменение энергии активации коррелирует с изменением среднего поля подложки.

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FUNDAMENTAL AND APPLIED PROBLEMS OF PHYSICS

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In June, 2005 in Tunis under the initiative RAE there passed conference on a radio-activity. One much known scientist, the expert in the field of the elementary particles, working on the accelerator in Bern (Switzerland) (we shall not name his name) has told: the physics was terminated, the picture of a universe is drawn, all elementary particles are known, except for one.

I shall not quote the bible, I shall simply tell, that in second half XIX mark elderly and authoritative scientists spoke also from a word in a word. Simply surprisingly. These things pass at school. It means only one: there has come the next crisis of physics. In this connection it would be desirable to remind statement W. Heisenberg` and, made by him on pages of Journal « Successes of physical sciences » for 1976. He has told: to understand CRISIS (1976!) modern physics, it is necessary to return to sources of a century for the mistake and physics there have been made has gone not therefore ways.

I then was young also words of scientific such level have simply wounded me. I began to think: what questions the physics cannot solve? Such problem, in my opinion at that time, was only one - a problem of occurrence of the LIFE. Since Lui Pasteur's times up to six days in this direction in physics it is not made any opening. And, as one American scientist if in the universe the life somewhere else then the life from a miracle will turn in statistics will be found out has told. It is unique, that we know today, it that origin of a life is possible only in пацемических solutions and that, possessing molecular кираљностью, the organic molecules participating during trophy circuits and, possessing different mirror symmetry, rotate a plane of polarization of electromagnetic radiation in different directions. It is a lot of physicists as appeared, dealing with a problem of occurrence of the LIFE. And on this way many opening, not concerning to an investigated problem have been made.

The physics always was the locomotive for other sciences stimulating in them new opening and a new level of sights at their problems, providing thus progress in all science. Today we should solve: why there was a crisis and as us it to overcome. The majorities of scientists have become isolated in the problems and do not want to get into problems in which they do not feel like experts. But experience business acquirable, would be persistence and desire. One of the reasons will be, that physics specialize everyone in the narrow segment, and with development of a science this segment is quickly narrowed and, thus, is lost touch between various segments of a science. Scientists who would work in different areas of a science are necessary is allows them to protect not simply the thesis for a doctor's degree, and to leave on essentially new, higher level. Obviously, time qualitatively has come to change a level of preparation of students at universities, having entered new disciplines which would open connection of separate segments. Here it would be possible to make many offers, but it does not meet to a thematic orientation of article.

Once again we shall return by 1976. Then it was represented to me, that development of physics oc-

curs rough rates. Really, computers are created, rockets with cosmonauts have achieved the Moon, the problem of thermonuclear synthesis (theoretically it has been really solved) will be just about solved, almost new elementary particles every day open, with the help of plasma chemistry new chemical compounds are created, in particular, on the basis of connections of fluorine have been created Blood substitutes. Little bit later new particles - fullerenes were open. It was supposed, that it will be followed with the whole cascade of opening of new chemical compounds. Where they today? Scientists continue to build molecules with different geometry on base fullerenes. Other scientists, trying to carry out their additive in powder iron materials, aspire to receive, thus, a material with transformation fullerenes in diamonds. (But it is an applied question and we shall separately discuss them). More and more new and more powerful telescopes are under construction, our sight at the universe varies. In this connection it was offered our universe which has arisen from a point, to name the Metagalaxy. I.e. The Metagalaxy is that part of the universe which we today can not only observe, but also imagine. There, where borders of our imagination come to an end, the Metagalaxy there comes to an end. It is known, that age of our Metagalaxy of the order 15 billion years and there was it from a point which has received in the scientific literature the name сингулярности (by analogy to mathematics). As a whole then it seemed to me, that there is a blossoming a science.

What has taken place today?

Forward the biology with studying various genotypes, cloning, decoding DNC, etc. has escaped. By the way, the founder of molecular biology was E. Schrödinger. Увлёкшись а problem of occurrence of a life, he even has written the book about occurrence of the life, representing set of assumptions. But the biology could not, and without physics cannot, answer a question: as the life has arisen. Words about evolution is an empty phrase. Evolution is possible only when is to that evolve. And we cannot understand, how from notracemic solution there was the most simple if this word in general is applicable to a problem of the Life, a cell!

The computer direction has turned to independent and roughly developing branch theoretical and applied science. From this point of view of us the big technical progress connected to development of computer technique (technical equipment) expects. In my opinion, this area cannot be related to physics for the physics is a science about the nature of a matter and never it is impossible to forget about it.

If to look superficially the physics developed roughly enough prior to the beginning of 90th years of XX century. Really: nuclear processes are investigated full enough and the question was not creation

of chain nuclear reactions, and about compactness of nuclear devices. Elementary particles it was open so many that the rare expert on elementary particles could list them. The set of the new quantum numbers peculiar to elementary particles was open. Cosmologist argued on a theme on, whether possesses neutrino weight of rest and whether compression of the Metagalaxy back in "point" is possible. And suddenly with the help of the American orbital telescope "Hubble" in the Metagalaxy the dark weight has been found out. It did not enter interaction with an investigated matter, did not react to electromagnetic interaction of any frequency and did not let out it at interaction with high-speed streams of particles. It entered only gravitational interaction with the big weights of galaxies, forcing them to rotate around of itself. (But I warn is not a black hole). I would not risk to identify of Einstein gravitation and gravitation of dark weight. It is not enough data. Today it is known, that the dark weight makes 95 % of weight of the Metagalaxy. Usually we understand a measure of inertia (classical definition) as weight, but here to tell more pertinently, that the weight is a measure of gravitational influence of one body on another. However this definition also can be incorrect. Here there are many questions on which in the foreseeable future there is no answer and, naturally, we thought, that we can not put laboratory experiments. But it appeared not so, and attempt of such experiments at presence of surprising results, has met sharp resistance among many already known physicists. Though young physics have considered these results with delight (they still do not have scientific authority and they have nothing to lose).

But we shall return to words W. Heisenberg and in 1976 that in the beginning of a century the physics has gone not therefore ways. W. Heisenberg has not explained the idea, proving this thesis on several pages, and even on the contrary has as though coded it, having transformed in something such as the theorem the Farm. Obviously, his ideas were so orthodox, that he was afraid, that him will not understand. We shall imagine mental experiment. In the beginning of XIX century the French scientist A. J. Fresnel, addressing to academicians of the French academy of sciences has excellent proved the wave nature of light. Before 150 years the idea about the corpuscular nature of light of Newton dominated. The authority of Newton was so is great, that anybody and did not try to call in question his theory about the corpuscular nature of light. After opening by a wave of the nature of light A. J. Fresnel creation of the equations of the electromagnetic nature of light Maxwell has followed, then there were experiences of Hertz (Without it creation of radio and TV is impossible). In 1922-23 the Ameri-

can scientist A. Compton dispersion of electrons on photons has proved the corpuscular nature of light. Since then began to speak about wave-corpuscle dualism. That happened, happened. But we shall present, that before experiences of A. J. Fresnel A. Compton have proved the corpuscular nature of light. What occurs? Maxwell does not write the equations, the Hertz does not prove distribution to space of electromagnetic waves and as consequence - is not present during necessary time radio, TV. But emptiness does not happen. Means there should be other way of development of physics. It at all the fantasy, is any over a fantasy. In physics of such examples to result it would be possible, probably, much, but the physics solves, as a rule, those problems for which decision it is prepared. But new theories punch the way to a science with the big work.

The greatest influence on development of our sights on a picture of the Universe in XX century there were the opening connected to space factors. In the beginning of 70th years experiments on an establishment of conformity of a stream neutrino from the Sun theoretically settlement have been carried out. Experiences were carried out in the deepest Mines of the republic of South Africa, that misfire space radiation. On depth, approximately, 5 km the capacity with an isotope of chlorine which cooperates with neutrino has been located and process of division of nucleus of an isotope of chlorine is observed, and fragments of disintegration were registered by gauges. Appeared, that the stream neutrino was 300 times less settlement. At the end of a century this experiment have repeated on more perfect equipment on the same depth, but already in India. The result appeared the same. In my opinion, it was necessary to reconsider the concept of sources of star energy.

Nevertheless, comparative studying of various thermonuclear reactions has resulted Bethe at a dawn of the last century in the conclusion, that energy of the Sun and stars of the basic sequence is developed as a result of cyclic reactions in which the leading role is played with capture of a proton by nucleus of nitrogen and carbon with the subsequent formation of a nucleus of helium [1]. This theory Bethe which has received lately wide recognition, till now has no direct astrophysical acknowledgement(confirmations). I do not doubt, what will be astrophysics, not concordant with me then let they will explain - where disappear нейтрино or on the contrary - why them so a little?

Let's recollect kind memory of so known our compatriot of professor of Nikolay Aleksandrovich Kozyrev. Here we shall not speak about his recognized merits. N.A.Kozyrev in 1937 has been placed in camp for prisoners for the adherence of the theory of the extending universe (So then named the Me-

tagalaxy) and has left camp only in 1948. In three months after an output from camp, he has protected the thesis for a doctor's degree on a theme « Sources of star energy and the theory of an internal structure of stars ». N.A.Kozyrev's astronomical supervision has proved the following. In the first part two basic laws, an establishment « the period - average density "Cepheid" are investigated. The results received from the analysis of these laws, appeared distinct from usual representations of the theory of an internal structure of stars. Mainest of them the following: 1) In all stars, switching even super giants, beam pressure does not play an essential role, and it can be neglected in comparison with gas pressure; 2) internal areas of stars almost entirely will consist of hydrogen (the average molecular weight is close to $\frac{1}{2}$; 3) absorption of light is caused томсоновским by dispersion of light free электронами; 4) stars have the structures close to polytropic of a class $3/2$.

Set of the received results has allowed him to calculate as a first approximation physical conditions inside stars, proceeding from observable characteristics L, M, R. For example, for the center of the Sun the temperature about 6 million hailstones turns out., probably, not sufficient for thermonuclear reactions. [2]

N.A.Kozyrev has put forward a hypothesis according to which the basic source of star energy is current time. However, for some reason he has not gone further. The question arises - and where and what they themselves represent products of combustion? The most simple answer consists that the continuous stream of time of our World is radiated as quanta of time as products of combustion, in other World. Or in other universe - there should be all another: there is no continuous space - time and structure of a matter there too another. We have experimentally found out such particles (the quanta of time possessing in weight). They take root into nucleus of radioactive elements, change their activity and a half-life period due to the quantum number, and, it is possible and, due to defect of weight, but in nuclear transformations do not participate. It is necessary to tell, that, apparently, they do not possess neither weak, nor strong interaction. This interaction essentially other type also can achieve the next nucleus crystal volumetric - центрированной lattices, also changing their activity, but to a lesser degree. Certainly, it would be interesting to allocate these particles on accelerators and to study their properties. At an irradiation of a radioactive element such particles occur decrease(reduction) in a radioactivity approximately on 20 % to a mistake of measurement of 1 %. Two institutes have lead (have carried out) independently from each other such check and have received these figures.[3,4]

We 18 years ago have constructed trial installation by capacity more, than in 20 000 times, but at start have made a small mistake and through 20 with installation has turned in heap the fused metal, quartz, etc. But, the main thing, it has shown correctness of the chosen method. Equipment of the atomic power station by such installations and their start in case of failure, will lead to to the immediate discontinuance of all chain reactions and will prevent accident. Probably, also to use them for deactivation radiation polluted territories. The further work appeared impossible as the scientific part has been closed in 1990-1991.

But the main thing, development of the New physics constructed on other principles, already чрез 20 years will allow to achieve, practically, all stars of our sleeve of the Galaxy. Modern spacecrafts use in the flights energy of an electronic environment of atom or, speaking differently, energy of chemical communication. Clearly, that on such rockets the Mankind cannot master even Solar system. And meanwhile there is a probability of collision of the Earth with space bodies of the big weight and today at us there is nothing them to oppose, and it would mean destruction of a civilization. However, the New physics if we have no an opportunity to put laboratory experiments will guess what for what.

We shall not discuss all questions of physics but only what will give us new knowledge of the nature of a matter and will affect other areas of physics in this article. It is possible to attribute construction "Tokomac" to them, lasers of ground basing, etc. Theoretically this direction is already exhausted.

However there is one problem which, obviously, will be eternal. With development of technical equipment all new and new materials with new properties will be required. The materiology and physics of a firm body is engaged in these questions.

Somewhere at the end of 70th years arises and the theory and practice of small particles and ultradisperse systems starts to develop intensively. Later they will be widely known as nanosystem. We shall not consider superconducting nanoceramics as it has arisen already for a long time and its development can be named safe. Affairs with nanoceramics constructional and functional purpose in another way are.

Cases in point concern to applied questions of physics. Ultradisperse systems cannot be related to physics of a firm body. They, most likely, are formed in independent area of physics. Who is interested in this question in more detail, I recommend magazine « Successes of physical sciences ».

There are many ways of formation of ultradisperse systems with the size of particles at narrow width of the histogram about 10 nanometers. But at them common fault. They I have high superficial

energy and, hence, tend to adhesion. The purpose - their creations of compact materials from 100 % in density. The most perspective material of last 20 years considers диоксид the zirconium, stabilized оксидом иттрия. I.e. in a lattice of a crystal диоксида zirconium one atom is replaced with atom of the stabilizer and it allows for dioxide to avoid some zirconium of phase transformations. Properties of an expected material: over plasticity, preservation of physicomaterial properties at achievement of temperatures about 3000 K. Mogut to be and other high-temperature materials. For them stabilizers, modes of formation, pressing, sintering are selected. Each of stages represents the whole research. In the present in the world laboratory samples Are received only and nobody will tell, whether нанокерамика will be sometime introduced into manufacture. This direction most perspective of all which exist within the framework of physics of a firm body.

In the same way we created ceramic nano membranes with open porosity of 10 nanometers and полушириной histograms of 1 nanometer. Continuous nano crystal fibres with high resistance of deformation on a bend (0,5 mm) for creation of composite materials with special properties. Many works on development of methods of structural deformations are translated to other languages. Questions applied and we of them shall not consider(examine) all this in details.

The main question - whether will be possible to convince scientific community of that to start works in the field of New physics.

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ФУНДАМЕНТАЛЬНЫЕ И ПРИКЛАДНЫЕ ПРОБЛЕМЫ ФИЗИКИ

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В июне 2005 г. в Тунисе по инициативе РАЕ проходила конференция по радиоактивности. Один очень известный ученый, специалист в области элементарных частиц, работающий на ускорителе в г. Берн (Швейцария) (Не будем называть его имени) сказал: физика кончилась, картина мироздания нарисована, все элементарные частицы известны, кроме одной.

Не буду цитировать библию, просто скажу, что во второй половине XIX века пожилые и авторитетные ученые говорили также из слова в слово. Просто удивительно. Эти вещи проходят в школе. Это означает только одно: наступил очередной кризис физики. В связи с этим хотелось бы напомнить высказывание W. Heisenberg'a, сделанное им на страницах журнала «Успехи физических наук» за 1976 год. Он сказал: чтобы понять КРИЗИС (1976 г.!) современной физики, надо вернуться к истокам века, ибо там была сделана ошибка и физика пошла не потому пути.

Я тогда был молод и слова ученого такого уровня просто ранили меня. Я стал думать: какие вопросы не может решить физика? Такой проблемой, на мой взгляд в то время, была только одна - проблема возникновения ЖИЗНИ. Со времен Луи Пастера до сих дней в этом направлении в физике не сделано ни одного открытия. И, как сказал один американский ученый, если во Вселенной будет обнаружена жизнь где-нибудь еще, тогда жизнь из чуда превратится в статистику. Единственно, что нам известно сегодня, это то, что зарождение жизни возможно только в рацемических растворах и то, что, обладая молекулярной киральностью, органические молекулы, участвующие в процессах трофических цепей и, обладающие разной зеркальной симметрией, вращают плоскость поляризации электромагнитного излучения в разных направлениях. Много физиков, как оказалось, занимались проблемой возникновения ЖИЗНИ. И на этом пути было сделано много открытий, не относящихся к изучаемой проблеме.

Физика всегда была локомотивом для других наук стимулируя в них новые открытия и новый уровень взглядов на их проблемы, обеспечивая таким образом прогресс во всей науке. Сегодня мы должны решить: почему возник кризис и как нам его преодолеть. Большинство ученых замкнулись в своих проблемах и не хотят влезать в проблемы, в которых они не чувствуют себя специалистами. Но опыт дело наживное, было бы упорство и желание. Одна из причин состоит в том, что физики специализируются каждый в своем узком сегменте, а с развитием науки этот сегмент быстро сужается и, таким образом, теряется связь между различными сегментами науки. Нужны ученые, которые бы работали в разных областях науки - это позволяет им не просто защитить докторскую диссертацию, а выйти на принципиально новый, более высокий уровень. Очевидно, настало время качественно изменить уровень подготовки студентов в университетах,